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A taxonomic study of *Ooctonus* (Hymenoptera, Mymaridae) from Heilongjiang, China

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Abstract

Five species of *Ooctonus* Haliday (Hymenoptera, Mymaridae) from Heilongjiang Province, China, are reviewed. One species, *O. huberi* **sp. n.**, is described as new, and four species, *O. orientalis* Doutt, *O. saturn* Triapitsyn, *O. sublaevis* Förster and *O. vulgatus* Haliday are reported as new to China. A key to the females of the 10 described Chinese species is given. All the specimens are deposited in the insect collections of Northeast Forestry University, China.

Keywords

Chalcidoidea, Mymaridae, *Ooctonus*, taxonomy, new species, China

Introduction

Ooctonus currently contains 36 described species: one in the Australian region (Perkins 1905), 12 in the Palaearctic region, five in the Oriental region (Triapitsyn 2010), 14 species in the Nearctic region including three also distributed in the Palaearctic region (Huber 2012), three in the Afrotropical region (Huber et al. 2010), and four in the Neotropical region (Huber 2013). Here we describe a new species, record 4 others for the first time from northeast China, and provide a key to females of the 10 *Ooctonus* species known from China.

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Materials and methods

Twenty-three specimens (19 females and 4 males) of *Ooctonus* were collected in Heilongjiang Province, northeast China by sweeping, Malaise traps (MT) or yellow pan traps (YPT). Specimens were dissected and mounted in Canada balsam on slides following the method described by Noyes (1982) and modified for Mymaridae by Huber (1988). Photographs were taken with a digital CCD camera attached to an Olympus BX51 compound microscope, and most measurements were made from slide-mounted specimens using an eye-piece reticle. Total body length excluding ovipositor was measured with an eye-piece reticle from alcohol-preserved specimens before being dissected. All measurements are given in micrometers (μm). Triapitsyn (2010) and Huber (2012) should be consulted for depositories of type specimens, hosts, and literature references to species described from Palaearctic, Oriental, and Nearctic regions. Morphological terminology and abbreviations are those of Huber (2012). All the specimens listed below are deposited in Northeast Forestry University, Harbin, China (NEFU).

Key to the females of *Ooctonus* species in China

1 Metacoxa yellowish or brown, different in color from mesosoma **2**
– Metacoxa dark brown or black, almost same color as mesosoma **9**
2 Frenum (Figs 27, 34) smooth medially, reticulate at lateral borders, sometimes also at anterior and posterior margins **3**
– Frenum (Figs 5, 13, 19) entirely reticulate, sometimes only faintly so **4**
3 Funicle with 2 mps on fl_5 and fl_6; propodeum (Fig. 27) with median areole well separated from metascutellum by fairly long median carina, but the median carina often incomplete, not extending to anterior margin of propodeum, or almost absent ..... ***O. sublaevis***
– Funicle without mps on fl_5 and fl_6; propodeum (Fig. 34) with median areole abutting metascutellum; the median carina absent and replaced by the two carinae forming inner margin of dorsolateral areoles ..... ***O. vulgatus***
4 Mesoscutum (Figs 13, 19) with median longitudinal groove, the groove sometimes very short at posterior margin or extending about 0.7× length of mesoscutum **5**
– Mesoscutum (Figs 4, 34) without median longitudinal groove **6**
5 Funicle with 2 mps on fl_5 and fl_6; plica (Fig. 13) bifurcate anteriorly with a long lateral and long medial arm ..... ***O. orientalis***
– Funicle without mps on fl_5 and fl_6; plica (Fig. 19) bifurcate anteriorly with a short lateral and short medial arm ..... ***O. saturn***
6 Clava with 8 mps ..... ***O. insignis* Haliday**
– Clava with 7 mps 7
7 Funicle without mps on fl_6 ..... ***O. notatus* Walker**
– Funicle with 1 or 2 mps on fl_6 ..... **8**

8 Propodeum with median areole separated from metascutellum by median carina; plica with an anterior bifurcation; mesosoma yellow; ovipositor relatively long, at least 1.1× as long as metatibia ..... ***O. novickyi* Soyka**

– Propodeum (Fig. 5) with median areole abutting metascutellum; the median carina absent and replaced by the two carinae forming inner margin of dorsolateral areoles; plica without an anterior bifurcation; mesosoma dark brown; ovipositor relatively short, at most 0.9× as long as metatibia ..... ***O. huberi***

9 Body length about 1 300 μm; mesoscutum without median longitudinal groove or at most with very short one ..... ***O. himalayus* Subba Rao**

– Body length about 2 600 μm; mesoscutum with long median longitudinal groove (at least 0.5× length of mesoscutum) ..... ***O. sinensis* Subba Rao**

Taxonomy

***Ooctonus huberi* Bai, Jin & Li, sp. n.**
http://zoobank.org/9E177EE9-7AD7-4FB2-B8A1-57A71D8B23F4
Figs 1–11

Holotype. ♀ (NEFU) Harbin City, Maoershan Town, Mt. Maoershan, 700m. 18.VIII. 2014, Cheng-De Li, Hai-Feng Bai, Xiang-Xiang Jin, YPT.

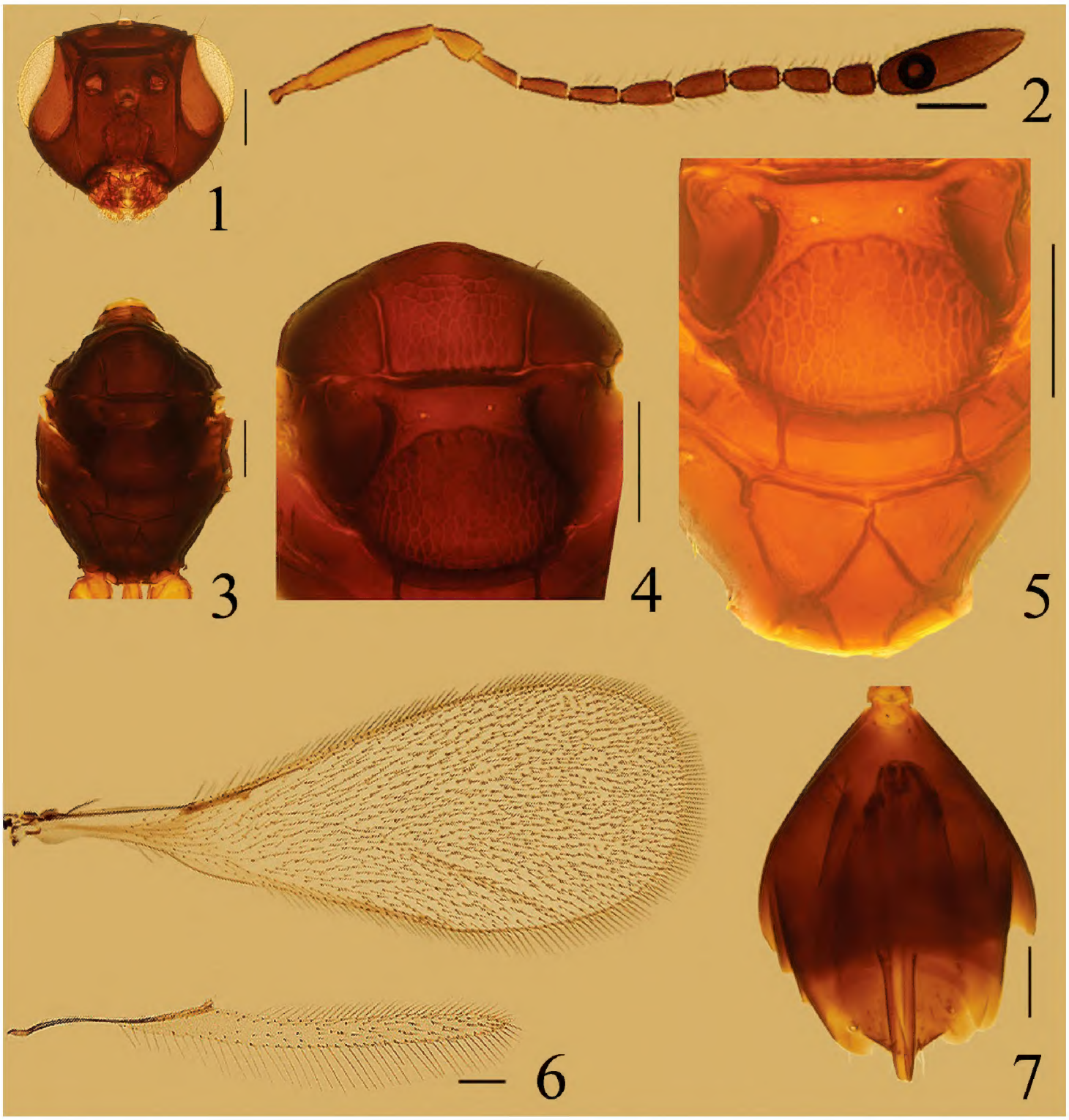
Paratypes. 3 females, 2 males. Harbin City, Maoershan Town: Jianlagou. 4–17. VIII. 2014, Cheng-De Li, Hai-Feng Bai, Chao Zhang, Zhi-Guang Wu (2 ♀ ♀, NEFU), MT; same data as holotype (2 ♂ ♂, NEFU); Laoyeling. 16–29.VIII. 2013, Cheng-De Li, Hai-Feng Bai (1 ♀, NEFU), MT.

Diagnosis. Funicle (Fig. 2) with 2 mps at least on fl_4–fl_8 and 7 mps on clava; mesoscutum (Fig. 4) without median longitudinal groove; frenum (Figs 4, 5) entirely reticulate; propodeum (Fig. 5) with median areole abutting metascutellum; the median carina absent and replaced by the two carinae forming inner margin of dorsolateral areoles; plica without an anterior bifurcation; petiole 3.54–4.05× as long as wide; ovipositor (Fig. 7) slightly exserted, about 0.9× as long as gaster, and 0.86–0.90× as long as metatibia.

Ooctonus huberi sp. n. runs to *O. novickyi* in Triapitsyn's key (2010), and the differences are shown in the key above. The new species is also similar to *O. lokomotiv*. Both species have 1 mps sometimes on fl_3 and 2 mps on fl_4–fl_8 and have reticulation on mesoscutum and frenum, but *O. huberi* sp. n. differs from the latter by having 7 mps on the clava (8 mps in *O. lokomotiv*); petiole 3.54–4.05× as long as wide (2.6–3.3× in *O. lokomotiv*); and ovipositor 0.86–0.90× as long as metatibia (1.2–1.4× in *O. lokomotiv*).

Description. Female. Body length 1240–1380. Head and mesosoma dark brown, metasoma brown; scape and pedicel mostly yellow except dorsally dark brown; fl_1 brown, remainder of funicle dark brown; petiole and legs yellow except apical tarsomere brown.

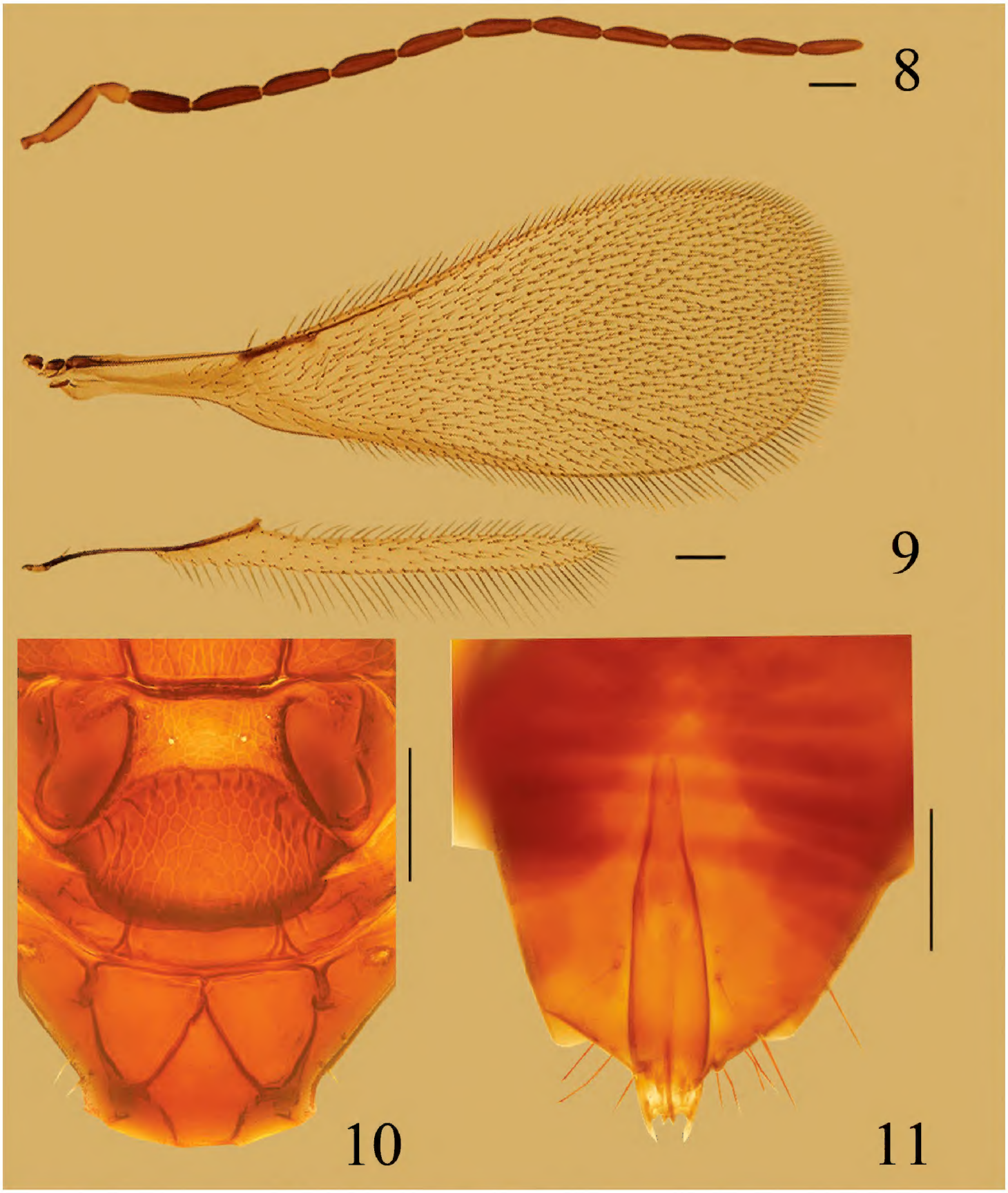
Head. Head (Fig. 1) width 396–406. Vertex without stemmaticum. Mid ocellus diameter 29–31. Vertex with conspicuous reticulate sculpture; face with faint, inconspicuous reticulate sculpture.



Figures 1–7. *Ooctonus huberi* sp. n., holotype female (Jianlagou): **1** head, dorsal **2** antenna **3** mesosoma, dorsal **4** mesoscutum and scutellum, dorsal **5** frenum and propodeum, dorsal **6** wings **7** gaster, dorsal. Scale bars = 100 μm.

Antenna. Antenna (Fig. 2) with scape 4.61–5.25× as long as wide, slightly longitudinally striate; pedicel slightly longer than fl_1; funicle with 2 mps on fl_4–fl_8 and 7 mps on clava, and sometimes fl_3 with 1 mps on one antenna. Clava 3.17–3.31× as long as wide, slightly longer than fl_6–fl_8 together. Measurements (length/width): radicle 53, scape 199–204/ 38–43, pedicel 65–72/ 36–38, fl_1 60–72/ 22–24, fl_2 70–79/ 24–26, fl_3 72–77/ 26–29, fl_4 77–82/ 29–34, fl_5 77–79/ 31–36, fl_6 72–77/ 31–36, fl_7 70–79/ 36–38, fl_8 58–65/ 43–46, clava 221–240/ 70–74.

Mesosoma. Mesosoma (Fig. 3) with pronotum weakly sculptured. Mid lobe of mesoscutum (Fig. 4) with meshes raised; scutellar setae long, extending posterior to



Figures 8–11. *Ooctonus huberi* sp. n., paratype male (Jianlagou): **8** antenna **9** wings **10** posterior part of mesoscutum to propodeum, dorsal **11** genitalia. Scale bars = 100 μm.

medially concave frenal line; frenum 0.69–0.75× mesoscutellum length and entirely reticulate. Metanotum with metascutellum smooth. Propodeum (Fig. 5) smooth between carinae and its anterior margin with a stub slightly lateral to lateral margin of metascutellum; median areole abutting metascutellum; the median carina absent and replaced by the two carinae forming inner margin of dorsolateral areoles; plica almost straight, extending almost to anterior margin of propodeum just medial to stub, without an anterior bifurcation but with a slight curved thickening posterior to the stub.

Wings. Fore wing (Fig. 6) length 1415–1512, width 512–585, length/width 2.57–2.76, longest marginal setae 77–84, 0.13–0.15× as long as greatest wing width. Marginal vein length 125–132. Hind wing (Fig. 6) length 1049–1122, width 67–70, length/width 16–17, longest marginal setae 122–125.

Metasoma. Petiole 3.54–4.05× as long as wide, 1.35–1.38× as long as metacoxa, shorter than metacoxa + metatrochantellus. Gaster (Fig. 7) with ovipositor length 455–485, slightly exserted, 0.89–0.91× as long as gaster, and 0.86–0.90× as long as metatibia (515–525).

Male. Body length 1230–1310. Mid ocellus diameter 29–31. Antenna (Fig. 8). Measurements, length: radicle 48–50, scape 139–144, pedicel 60–70, fl_1 125, fl_2 137–144, fl_3 142–144, fl_4 134–139, fl_5 142, fl_6 137–142, fl_7 137–142, fl_8 134–139, fl_9 130, fl_{10} 132–137, fl_{11} 134–142. Total flagellar length 1537–1561. Fl_6 length/width 4.21–4.38, with 7 mps. Fore wing (Fig. 9) length 1463–1512, width 561–585, length/width 2.50–2.70, longest marginal setae 89–101, 0.15–0.18× as long as greatest wing width. Hind wing (Fig. 9) length 1073–1122, width 72, length/width 14.91–15.58, longest marginal setae 132–134, 1.83–1.87× as long as greatest wing width.

Host. Unknown.

Etymology. This species is named in honor of JT Huber, of the Canadian Forest Service, Ottawa, Canada.

Ooctonus orientalis Doutt, 1961

Figs 12–15

Triapitsyn 2010: 36–40 (redescription, primary type data, distribution).

Specimens examined. 3 ♀ ♀. Harbin City, Maoershan Town: Laoyeling. 10–11.VI. 2013, Xiang-Xiang Jin, Si-Zhu Liu, Chao Zhang, sweeping (1 ♀); Laoshan. 12–14.VI. 2013, Xiang-Xiang Jin, Si-Zhu Liu, Chao Zhang, YPT (1 ♀); Jianlagou. 19.VII. 2014, Cheng-De Li, Hai-Feng Bai, Xiang-Xiang Jin, Yan Gao, YPT (1 ♀).

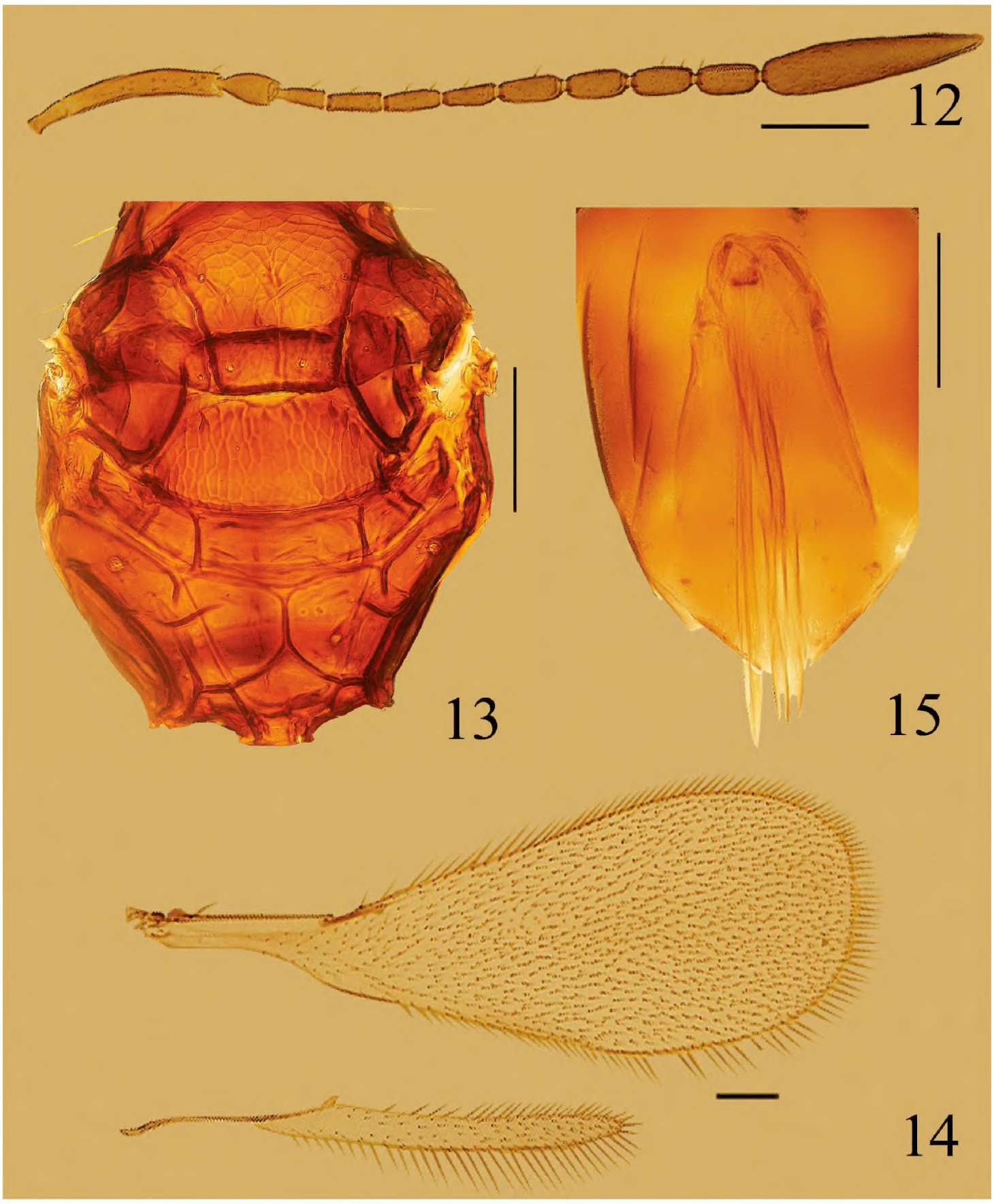
Diagnosis. Funicle (Fig. 12) usually with 2 mps on fl_5–fl_8 and 7 mps on clava; mesoscutum (Fig. 13) with median longitudinal groove, the groove sometimes very short at posterior margin of mesoscutum or extending about 0.7× length of mesoscutum; frenum entirely reticulate; propodeum (Fig. 13) with median areole separated from metascutellum by long median carina; plica bifurcate anteriorly with a long lateral and shorter medial arm.

Ooctonus saturn Triapitsyn, 2010

Figs 16–24

Triapitsyn 2010: 36–40 (description, type data, distribution).

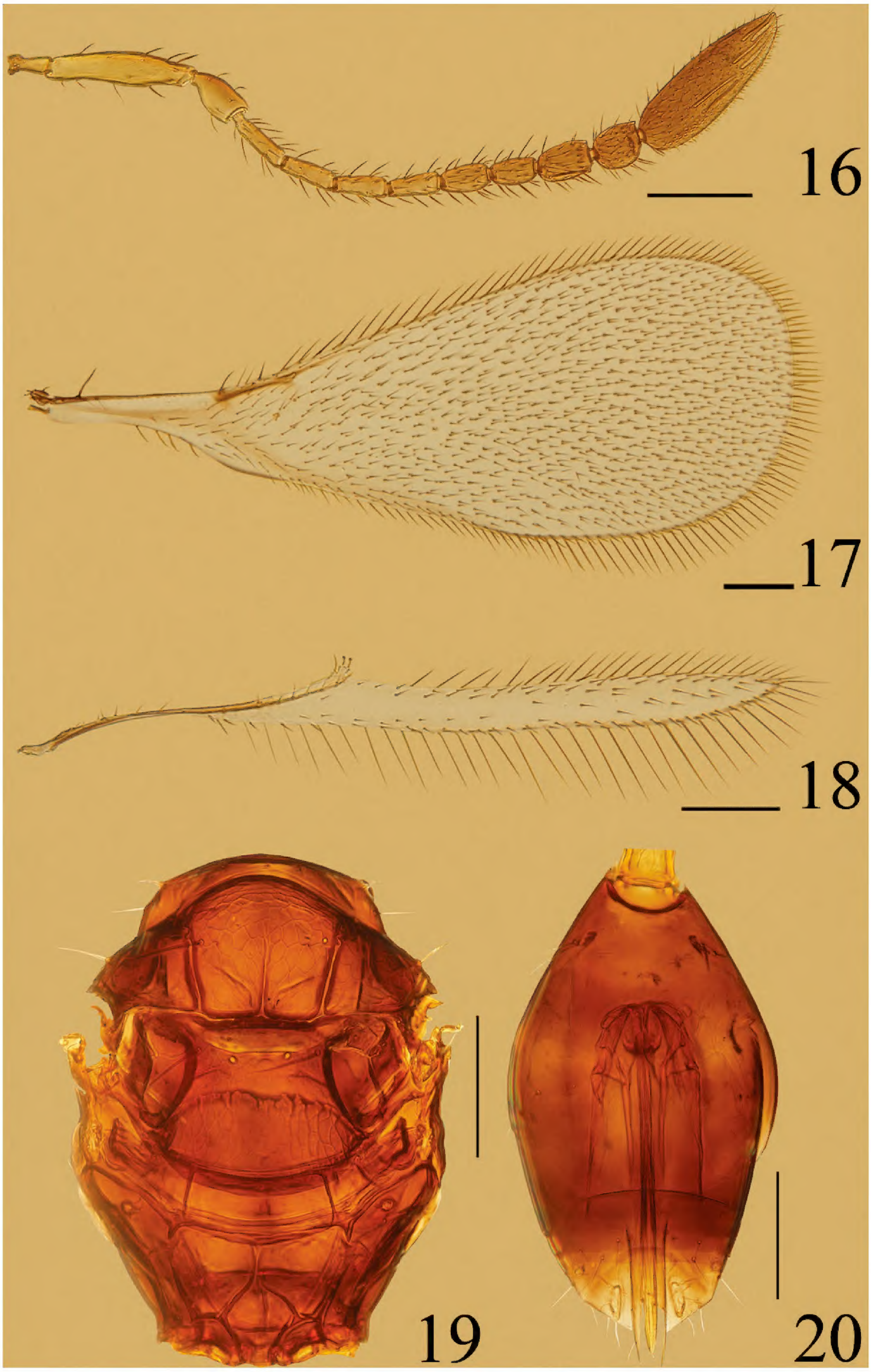
Specimens examined. 7 ♀ ♀, 2 ♂ ♂. Harbin City, Maoershan Town: Jianlagou. 1–17.VI. 2014, Cheng-De Li, Hai-Feng Bai, Ye Chen, Chao Zhang, MT (3 ♀ ♀);



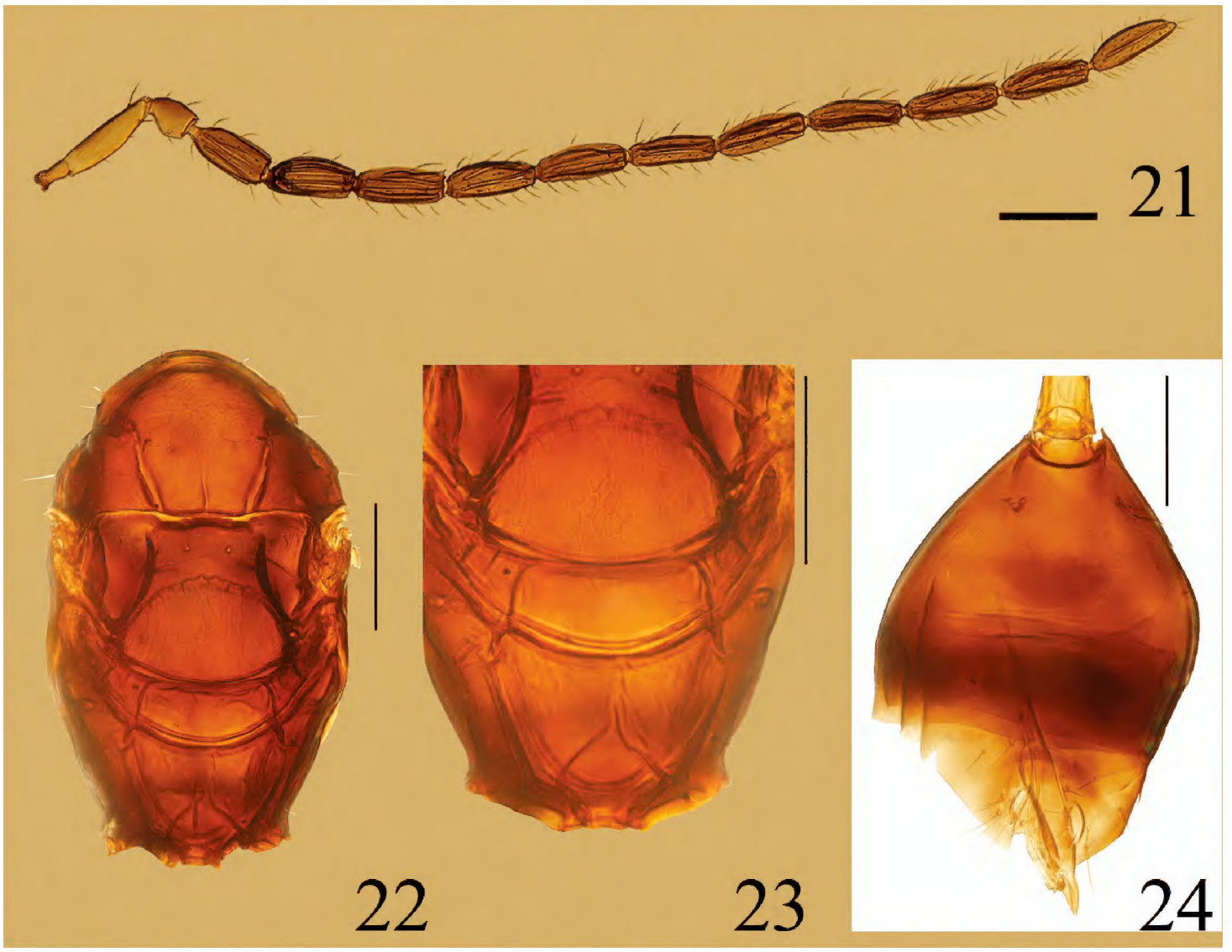
Figures 12–15. *Ooctonus orientalis*, female (Laoyeling): **12** antenna **13** part of mesosoma, dorsal **14** wings **15** ovipositor. Scale bars = 100 μm.

Jianlagou. 4.VIII. 2014, Cheng-De Li, Hai-Feng Bai, Xiang-Xiang Jin, Yan Gao, sweeping (1 ♀); Laoshan. 12–14.VI. 2013, Xiang-Xiang Jin, Si-Zhu Liu, Chao Zhang, YPT (1 ♀); Jianlagou. 17.VI. 2014, Cheng-De Li, Hai-Feng Bai, Ye Chen, Chao Zhang, YPT (2 ♀ ♀, 2 ♂ ♂).

Diagnosis. Funicle (Fig. 16) with 2 mps on fl_7 and fl_8 and 7 mps on clava; mesoscutum (Fig. 19) with median longitudinal groove, the groove sometimes very short



Figures 16–20. *Ooctonus saturn*, female (Jianlagou): **16** antenna **17** fore wing **18** hind wing **19** mesosoma, dorsal **20** gaster. Scale bars = 100 μm.



Figures 21–24. *Ooctonus saturn*, male (Jianlagou): **21** antenna **22** mesosoma, dorsal **23** part of mesosoma, dorsal, **24** gaster. Scale bars = 100 μm.

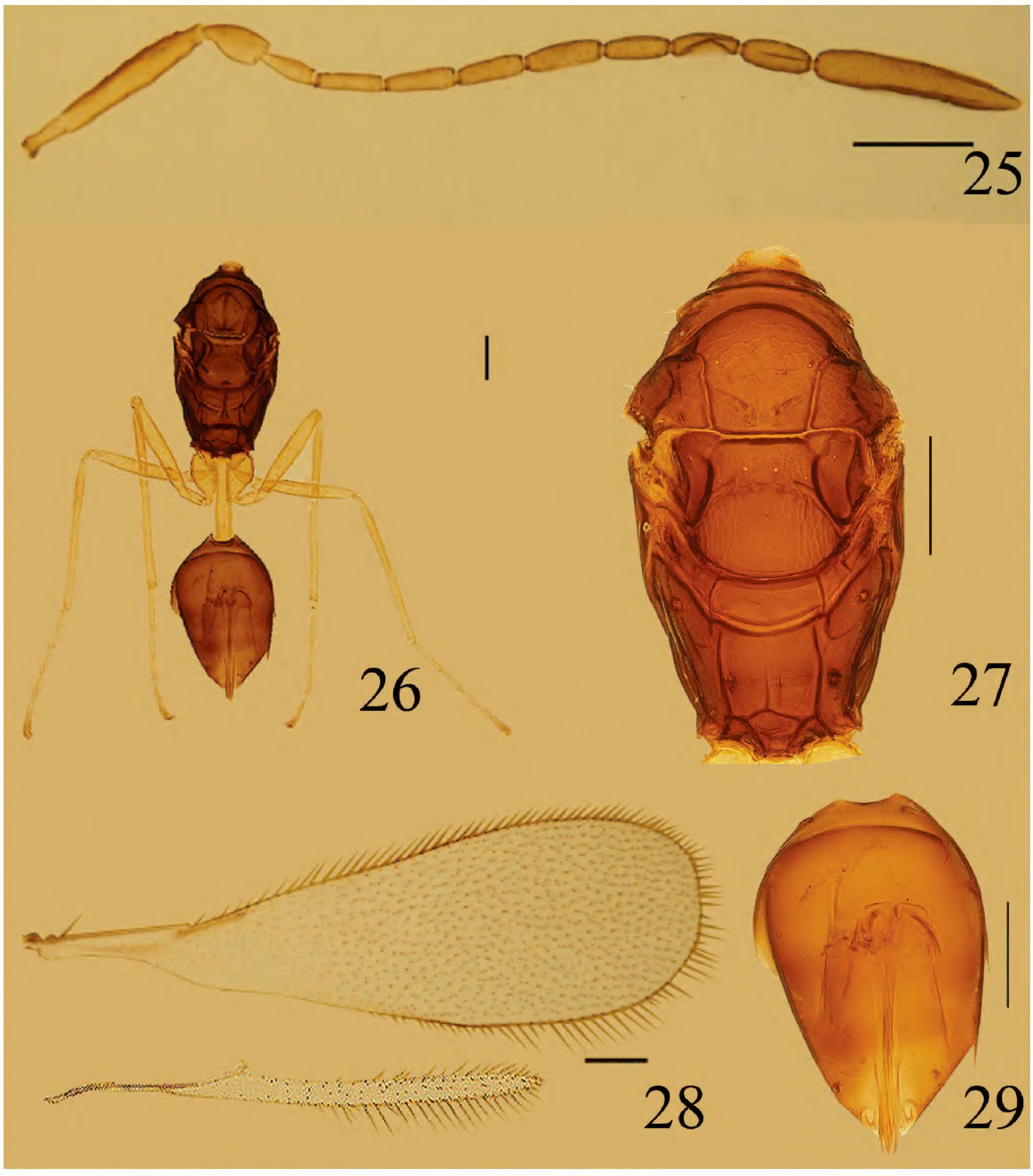
at posterior margin of mesoscutum or extending about 0.5× length of mesoscutum; frenum entirely reticulate; propodeum (Fig. 15) with median areole separated from metascutellum by median carina; plica with a short bifurcation anteriorly.

Ooctonus sublaevis Förster, 1847

Figs 25–29

Specimens examined. 4 ♀ ♀: Harbin City, Maoershan Town, Laoyeling. 10–11. VI. 2013, Xiang-Xiang Jin, Si-Zhu Liu, Chao Zhang, sweeping (1 ♀); Yichun City, Wuying Town, Fenglin Natural Reserve. 3–4.VII. 2013, Guo-Hao Zu, Hui Geng, Si-Zhu Liu, Yang Peng, sweeping (3 ♀ ♀).

Diagnosis. Funicle (Fig. 25) usually with 2 mps on fl_5–fl_8 (occasionally fl_6 with just 1 mps) and 7 mps on clava; mesoscutum (Fig. 27) usually without median longitudinal groove, rarely with a very short groove; frenum with weak reticulate sculpture; propodeum (Fig. 27) with median areole well separated from metascutellum by fairly long median carina, but the median carina often incomplete, not extending to anterior margin of propodeum, or almost absent; plica straight or slightly curved outward and not divided anterodorsally.



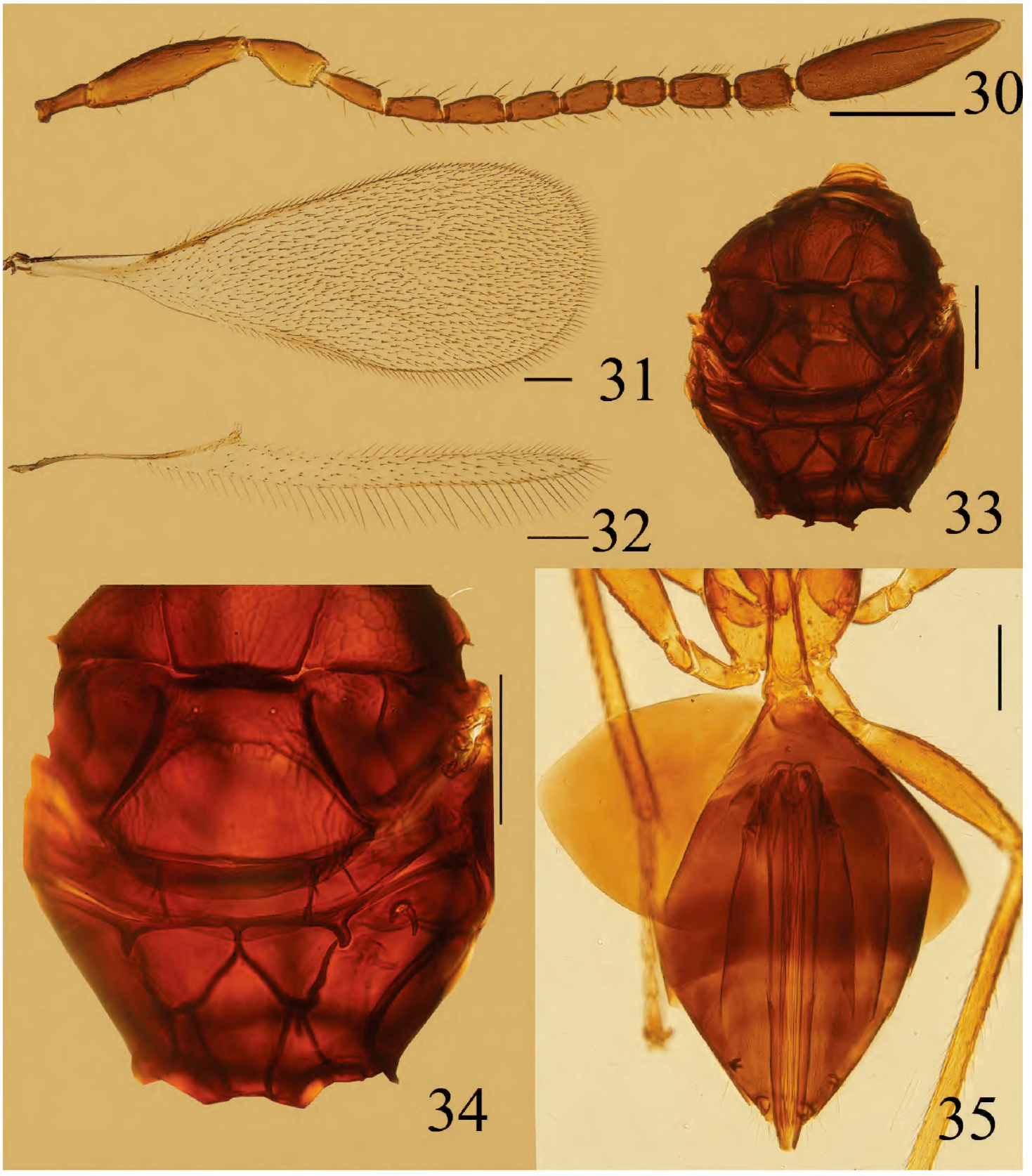
Figures 25–29. *Ooctonus sublaevis*, female (Fenglin Natural Reserve): **25** antenna **26** body, dorsal **27** mesosoma, dorsal **28** wings **29** gaster. Scale bars = 100 μm.

Ooctonus vulgatus Haliday, 1833

Figs 30–35

Specimen examined. 1 ♀. Harbin City, Maoershan Town, Laoyeling. 17.VI. 2014, Cheng-De Li, Hai-Feng Bai, Guo-Hao Zu, Ye Chen, sweeping.

Diagnosis. Funicle (Fig. 30) with 2 mps on fl_7 and fl_8 and 7 mps on clava; mesoscutum (Fig. 33) without median longitudinal groove; frenum mostly smooth,



Figures 30–35. *Ooctonus vulgatus*, female (Laoyeling): **30** antenna **31** fore wing **32** hind wing **33** mesosoma, dorsal **34** posterior part of mesoscutum to propodeum, dorsal **35** gaster. Scale bars = 100 μm.

except for obscure sculpture at lateral borders and sometimes also at anterior margin; propodeum (Fig. 34) with median areole abutting metascutellum; the median carina absent and replaced by the two carinae forming inner margin of dorsolateral areoles; plica almost straight and not divided anterodorsally, ending just anterior and medial to stub.

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